



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

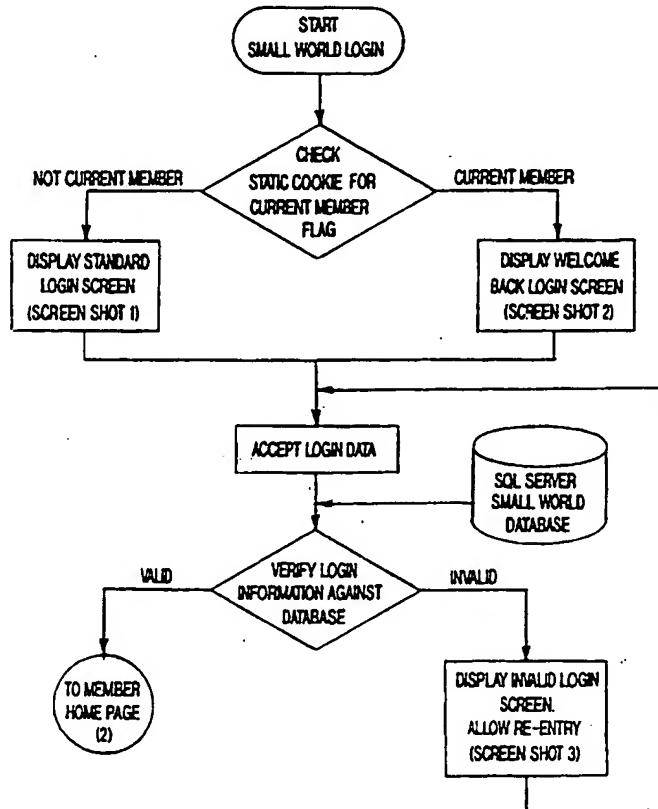
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(21) International Application Number: PCT/US97/21853  (22) International Filing Date: 26 November 1997 (26.11.97)  (30) Priority Data: 60/031,497 27 November 1996 (27.11.96) US 60/052,337 11 July 1997 (11.07.97) US  (71) Applicant (for all designated States except US): SMALL WORLD GAME, INC. [US/US]; 1100 Rhode Island, N.E., Albuquerque, NM 87110 (US).  (71)(72) Applicant and Inventor: TREIDER, Kevin, C. [US/US]; 1100 Rhode Island, N.E., Albuquerque, NM 87110 (US).  (72) Inventor; and (75) Inventor/Applicant (for US only): REILLY, Michael, J. [US/US]; 1100 Rhode Island, N.E., Albuquerque, NM 87110 (US).  (74) Agent: MYERS, Jeffrey, D.; Peacock, Myers & Adams, P.O. Box 26927, Albuquerque, NM 87125-6927 (US).	(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.
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## (54) Title: DATA COMPARISON AND MATCHING METHOD AND APPARATUS

## (57) Abstract

An apparatus for and method of storing, comparing, and accessing information for a plurality of users by collecting a reference user's information including a list of other users with whom the reference user is acquainted; ranking a level of acquaintance with each user of the list of users; restricting access to information based on level of acquaintance between users; comparing accessible information between users; and reporting matches in the compared accessible information. Comparing and reporting may be performed via a wireless device, wherein the wireless device is such as a cellular telephone, beeper, palmtop, laptop, or personal information manager.



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## DATA COMPARISON AND MATCHING METHOD AND APPARATUS

### CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of the filing of U.S. Provisional Patent Application Serial  
5 No. 60/031,497, entitled "Small World Game", filed on November 27, 1996, and U.S. Provisional  
Patent Application Serial No. 60/052,337, entitled "Small World Network", filed on July 11, 1997,  
and the specifications thereof are incorporated herein by reference.

### BACKGROUND OF THE INVENTION

10 Field of the Invention (Technical Field):

The present invention relates to methods and apparatuses for automatically comparing information about two or more individuals or entities and reporting points of commonality.

Background Art:

15 The present invention is founded on the universal network of human relations described by the theory of the Small World Phenomenon. This theory states that any two people (or businesses), no matter how remote from each other, can be linked together in terms of intermediate acquaintances. References relating to this phenomena (and other general background references) are listed (and discussed in some instances) in pages 62-76 of U.S. Provisional Patent Application  
20 Serial No. 60/031,497.

Perhaps the closest analogue to the present invention are prior art computerized dating services. These provide for customers to state lists of preferences and interests. A computer then scores an individual's list against a plurality of lists of other customers, with potential mates of  
25 interest being flagged.

The present invention is directed to comparisons of information either of two predetermined individuals (or businesses or other entities) or of an individual against a plurality of other individuals. Each individual controls what level of information may be searched and accessed by other

-2-

individuals and permits ranking of security levels of known and unknown individuals permitting varying levels of access to an individual's information. The present invention is further capable of identifying chains of commonality and to use cellular phones and the like to enter, compare, and access information.

5

SUMMARY OF THE INVENTION (DISCLOSURE OF THE INVENTION)

The present invention is of an apparatus for and method of storing, comparing, and accessing information for a plurality of users comprising: collecting a reference user's information including a list of other users with whom the reference user is acquainted; ranking a level of acquaintance with each user of the list of users; restricting access to information based on level of acquaintance between users; comparing accessible information between users; and reporting matches in the compared accessible information. In the preferred embodiment, information is collected on both skills possessed and desired and skills desired by the reference user are compared against skills possessed by other users and/or skills possessed by the reference user are compared against skills desired by other users. Comparing may include lists of direct acquaintances of users and/or lists of acquaintances of direct acquaintances of users. Users may be informed whenever information has been matched and a reference user receives report including such users. Comparing and reporting may be performed for a reference user via a wireless device, such as any form of cellular telephones, beepers, palmtops, laptops, or personal information managers.

20

Objects, advantages and novel features, and further scope of applicability of the present invention will be set forth in part in the detailed description to follow, taken in conjunction with the accompanying drawings, and in part will become apparent to those skilled in the art upon examination of the following, or may be learned by practice of the invention. The objects and 25 advantages of the invention may be realized and attained by means of the instrumentalities and combinations particularly pointed out in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated into and form a part of the 30 specification, illustrate several embodiments of the present invention and, together with the description, serve to explain the principles of the invention. The drawings are only for the purpose

of illustrating a preferred embodiment of the invention and are not to be construed as limiting the invention. In the drawings:

Fig. 1 is a flow diagram of the login sequence of the preferred embodiment;

5

Fig. 2 is a flow diagram of the "user home" page of the preferred embodiment;

Fig. 3 is a flow diagram of the "add user" page of the preferred embodiment;

10

Fig. 4 is a flow diagram of the "search" page of the preferred embodiment;

Fig. 5 is a flow diagram of the "send message" page of the preferred embodiment;

Fig. 6 is a flow diagram of the "edit user profile" page of the preferred embodiment;

15

Fig. 7 is a flow diagram of the "edit contact access" page of the preferred embodiment;

Fig. 8 is a flow diagram of the "search for skill" page of the preferred embodiment;

20

Fig. 9 is a flow diagram of the "commonality search" page of the preferred embodiment;

Fig. 10 is a flow diagram of the "users needing skills" page of the preferred embodiment;

Fig. 11 is a screen shot of the "user login" page of the preferred embodiment;

25

Fig. 12 is a screen shot of the "user verification" page of the preferred embodiment;

Fig. 13 is a screen shot of the "invalid login" page of the preferred embodiment;

30

Fig. 14 is a screen shot of the "user home" page of the preferred embodiment;

Fig. 15 is a screen shot of the "add contact to list" page of the preferred embodiment;

Fig. 16 is a screen shot of the "search" page of the preferred embodiment;

5 Fig. 17 is a screen shot of the "internal message send" page of the preferred embodiment;

Fig. 18 is a screen shot of the "user information" page of the preferred embodiment;

Fig. 19 is a screen shot of the "search results" page of the preferred embodiment;

10 Fig. 20 is a screen shot of the "skill search" page of the preferred embodiment;

Fig. 21 is a screen shot of the "skill search results" page of the preferred embodiment;

15 Fig. 22 is a screen shot of the "commonality search" page of the preferred embodiment;

Fig. 23 is a screen shot of the "commonality search results" page of the preferred embodiment; and

20 Fig. 24 is a screen shot of the "needed skills search results" page of the preferred embodiment.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

(BEST MODES FOR CARRYING OUT THE INVENTION)

25 The present invention utilizes the theory of "six degrees of separation" which surmises that there are, at most, six intermediary acquaintances between any two people in the world. One aspect of the invention permits users to exchange acquaintance lists and tree structures. The invention compares, discovers, and highlights the users' mutual acquaintances and precisely illustrates the chain of acquaintances which connect the users to each other, the immediacy and the relative  
30 strengths of those links. Additionally, information the users have voluntarily entered into various fields will also be exchanged, compared, and highlighted. This interfacing builds matrices of

networked information among the users. This information space that the invention creates is constantly updated dynamically utilizing technologies such as the World Wide Web and wireless technology.

5        "Users" of the invention means any entities, including individuals, for-profit businesses, non-profit organizations, and government agencies. Use of the invention by a plurality of users over time creates new and constantly evolving relationships among the users and enables them to communicate and network with one another in constantly evolving ways to achieve static or constantly evolving goals. Non-limited examples of manners in which the invention may be  
10 employed are:

- Business networking;
- Discovering mutually shared interests;
- Marketing inquiries;
- Searching for targeted connections;
- 15      • Searching for multiple connections;
- Dating;
- Finding a good mechanic or other service or goods provider;
- Genealogical research;
- Health research;
- 20      • Sociological studies; and
- Corporate marketing.

With mutual consent, the users create, explore, and share all types of information among themselves. The invention provides a mechanism allowing non-users to voluntarily become temporary users so that they may enter and experience the invention before registering as full users.  
25      Users always have full control over their own information stored in the invention. Information exchanged is by voluntarily expressed choices of the user.

In the preferred embodiment, the invention provides the following objects and advantages:

30      • *A category driven interface for managing contacts.* Users are able to sort contacts within an unlimited number of user defined categories for easy navigation and retrieval.

-6-

- *A primary contact quick search mechanism.* Users are able to quickly search their primary contact list by any of the standard user database fields. A fuzzy logic search is preferably utilized.
- *Instantaneous personal profile updates for users.* Users are able to manage all aspects of their personal information. Any updates or changes will immediately take effect for any user who has been given access to this information.
- 5 • *Security management.* Each user is the gatekeeper of its own information. Users are able to define what level of information each contact will have access to.
- *Easy addition of other users to primary contact database.* Users are able to quickly and easily add other users to their primary contact database using only a call-sign and access password.
- 10 • *Addition of non-users to primary contact database.* Users have the option of adding contact information for non-users. These contacts are preferably not included in any of the external search functions.
- 15 • *Direct links to contact World Wide Web sites and Internet e-mail.* A direct link will be included from the contact profile listing to an associated URL (Uniform Resource Locator) or e-mail address.
- *Separate business and social profiles.* Users are able to keep separate business and social profiles. This allows multiple levels of searching dependent on need and relevant universe.
- 20 • *Skill search function.* Users are able to search their primary contact list as well as a list of "second tier" members. The second tier is comprised of the primary contacts of the members' contact list.
- *User account security.* Each user account is protected by an encrypted password. The user can change the user password at any time.
- 25 • *Transaction level security.* All transactions over the Internet are encrypted using a SSL (Secure Sockets Layer) conversation with the user's browser.
- *Server side integrated security.* The preferred server employs the Windows NT operating system with NTFS (NT File System) installed, which permits adherence to U.S. Government C2 security requirements.

The invention preferably provides for compatibility with all major World Wide Web browser software, including to date Microsoft Internet Explorer; Netscape Navigator and AOL (America On-Line) integrated browser, and any Netscape compatible browser. This permits at least the following platforms to benefit from the invention: Windows 3.1; Windows for Workgroups 3.11; Windows 95; 5 Windows NT 3.51 and 4.0; Windows CE (hand-held devices); Macintosh Power PC; AIX; BSD/386 Unix; HP-UX; IRIX 5 and 6; Linux; OSF/1; SunOS 4/1/3; SPARC Solaris 2.3 and 2.4; and OS/2.

The invention further easily provides for employment of "smart" cellular telephones and like portable devices (portable computers, palmtops, personal information managers, beepers, and the like).

10 The invention may be readily understood by one of ordinary skill in the art by examination of the flow diagrams of Figs. 1-10 and the screen prints of Figs. 11-14.

Although the invention has been described in detail with particular reference to these preferred embodiments, other embodiments can achieve the same results. Variations and 15 modifications of the present invention will be obvious to those skilled in the art and it is intended to cover in the appended claims all such modifications and equivalents. The entire disclosures of all references, applications, patents, and publications cited above are hereby incorporated by reference.

CLAIMS

What is claimed is:

1. A method of storing, comparing, and accessing information for a plurality of users, the method comprising the steps of:

- a) collecting a reference user's information including a list of other users with whom the reference user is acquainted;
- b) ranking a level of acquaintance with each user of the list of users;
- c) restricting access to information based on level of acquaintance between users;
- d) comparing accessible information between users; and
- e) reporting matches in the compared accessible information.

2. The method of claim 1 wherein the collecting step comprises collecting information on skills possessed and desired and the comparing step comprises a step selected from the group consisting of comparing the skills desired by the reference user against skills possessed by other users and comparing the skills possessed by the reference user against skills desired by other users.

3. The method of claim 1 wherein the comparing step comprises a step selected from the group consisting of comparing lists of direct acquaintances of users and comparing lists of acquaintances of direct acquaintances of users.

4. The method of claim 1 additionally comprising informing users whose information has been matched when a reference user receives report including such users.

5. The method of claim 1 wherein the comparing and reporting steps are performed for a reference user employing a wireless device, wherein the wireless device is selected from the group consisting of cellular telephones, beepers, palmtops, laptops, and personal information managers.

6. A apparatus for storing, comparing, and accessing information for a plurality of users, the apparatus comprising:

means for collecting a reference user's information including a list of other users with whom the reference user is acquainted;

means for ranking a level of acquaintance with each user of the list of users;

means for restricting access to information based on level of acquaintance between users;

means for comparing accessible information between users; and

means for reporting matches in the compared accessible information.

7. The apparatus of claim 6 wherein the collecting means comprises means for collecting information on skills possessed and desired and the comparing means comprises a means selected from the group consisting of means for comparing the skills desired by the reference user against skills possessed by other users and means for comparing the skills possessed by the reference user against skills desired by other users.

8. The apparatus of claim 6 wherein the comparing means comprises a means selected from the group consisting of means for comparing lists of direct acquaintances of users and means for comparing lists of acquaintances of direct acquaintances of users.

9. The apparatus of claim 6 additionally comprising means for informing users whose information has been matched when a reference user receives report including such users.

10. The apparatus of claim 6 wherein the comparing and reporting means comprise a wireless device selected from the group consisting of cellular telephones, beepers, palmtops, laptops, and personal information managers.

1/24

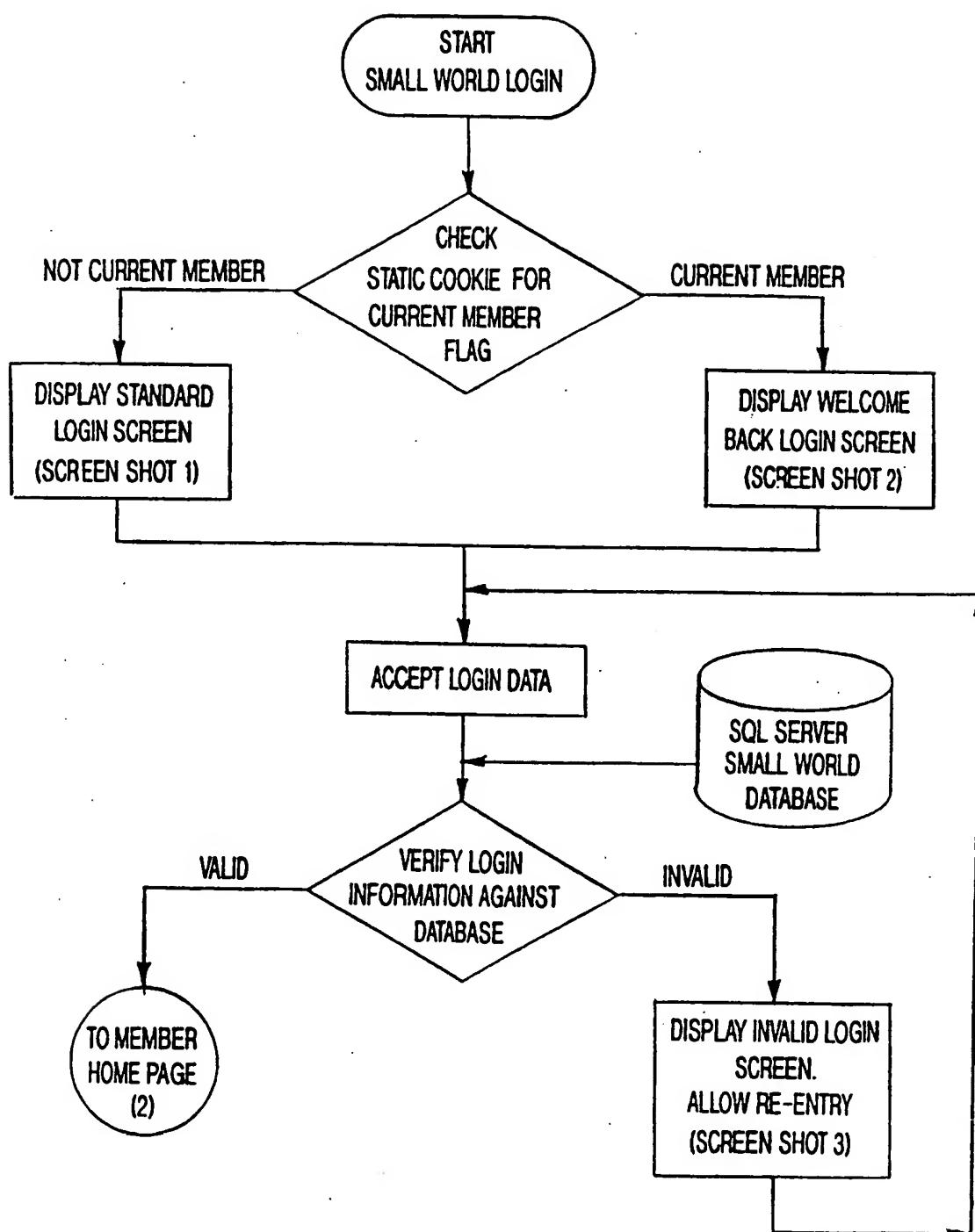


FIG-1

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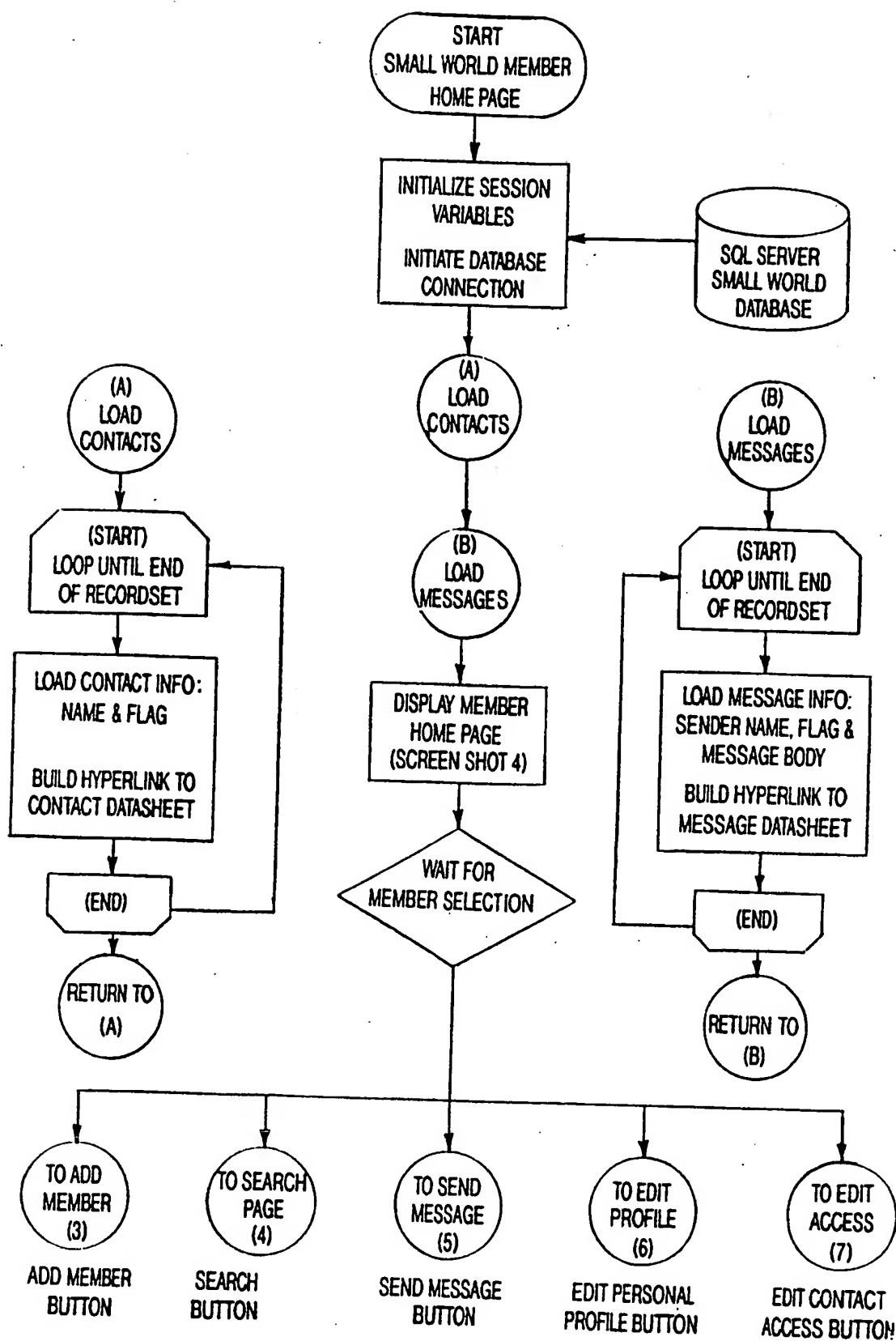


FIG-2  
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3/24

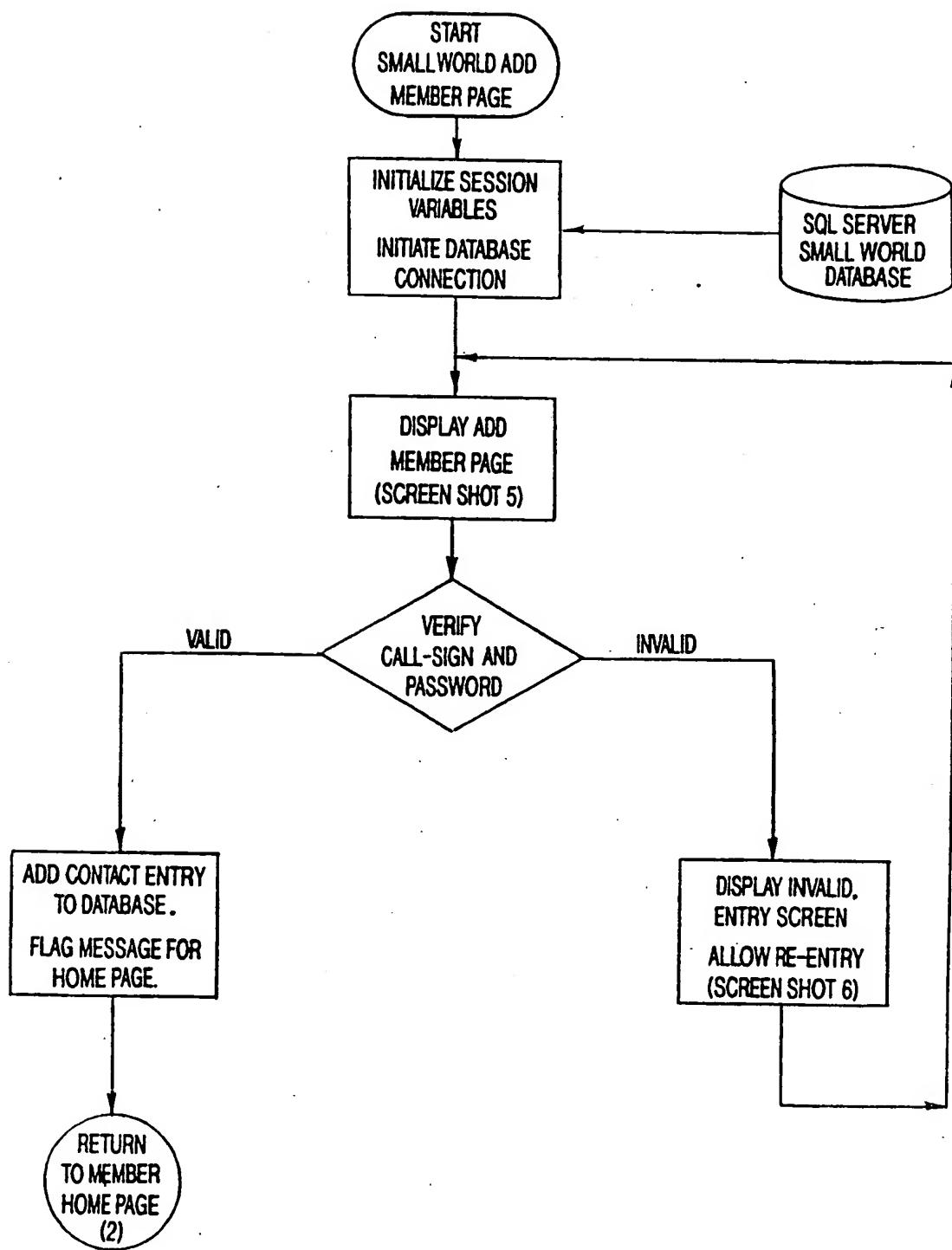


FIG-3

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4/24

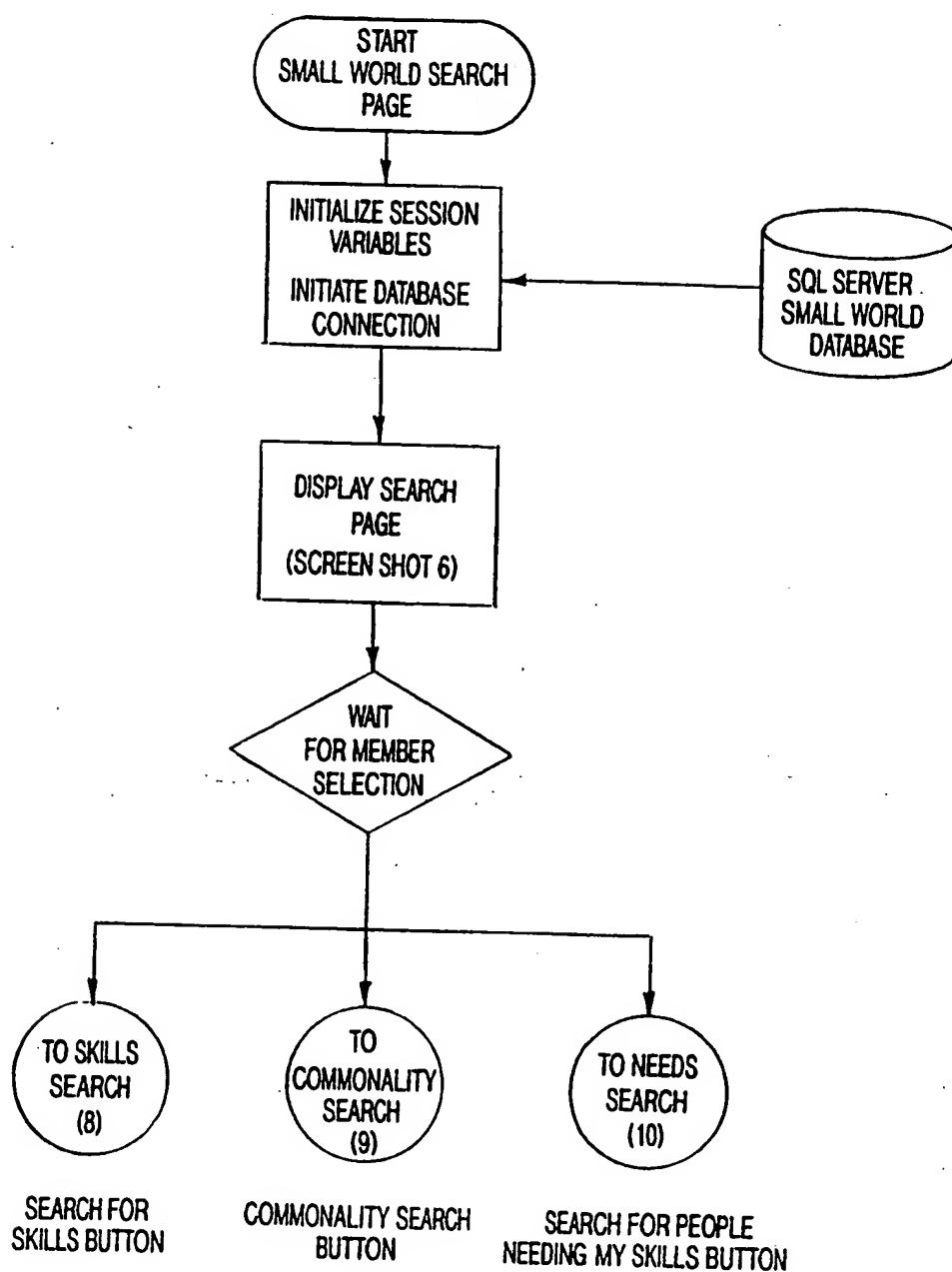


FIG-4  
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5/24

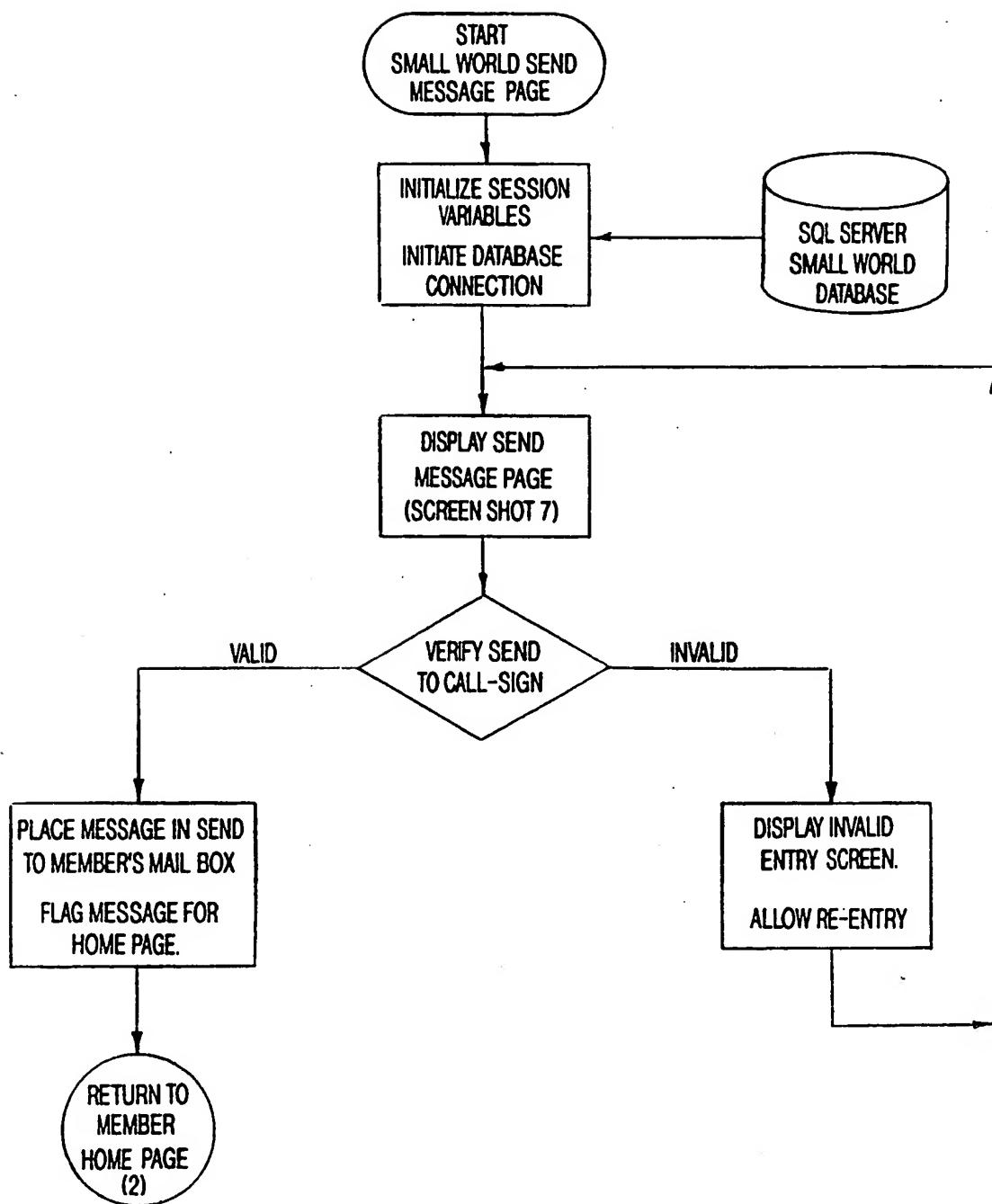


FIG-5  
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6/24

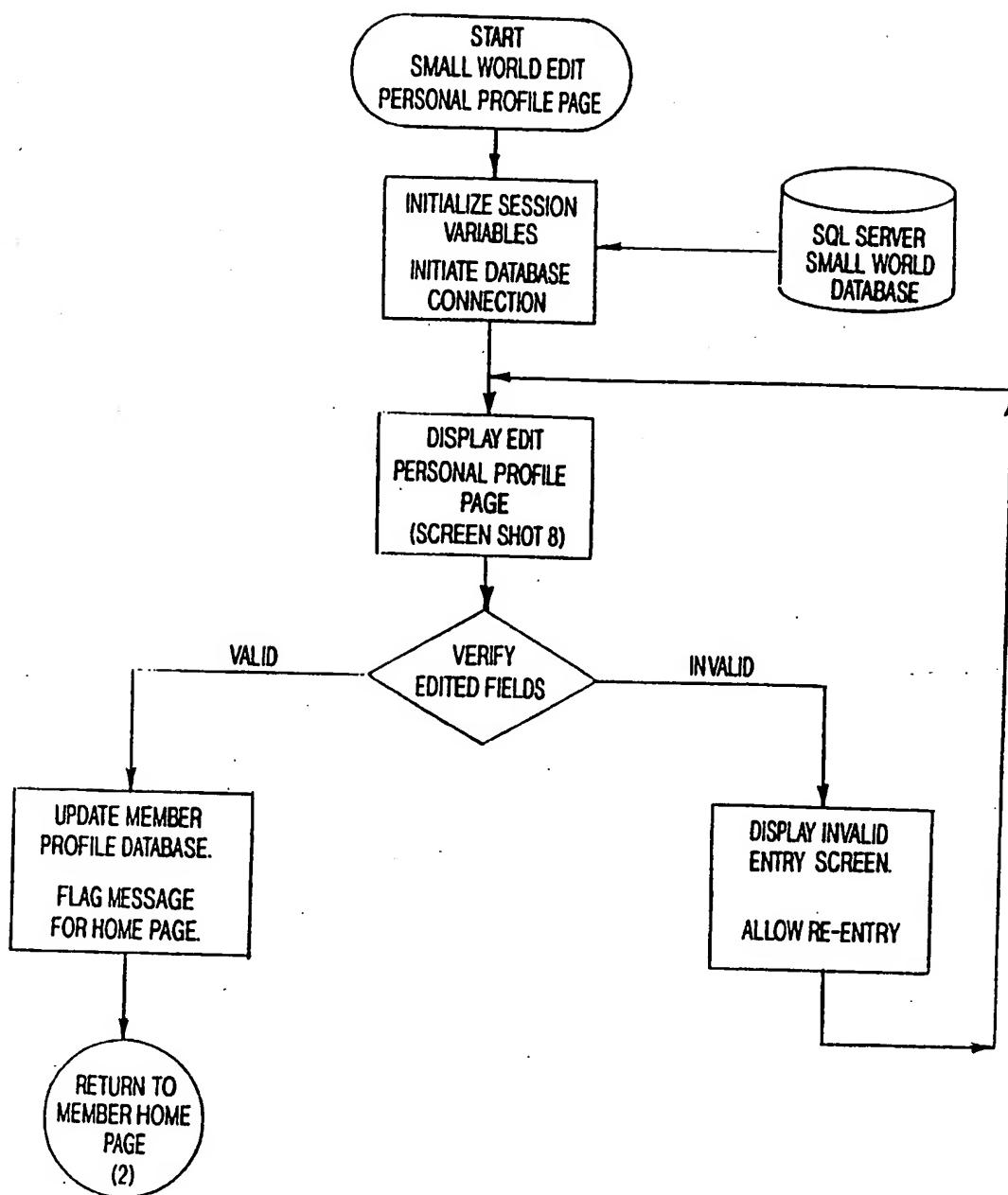


FIG-6  
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7/24

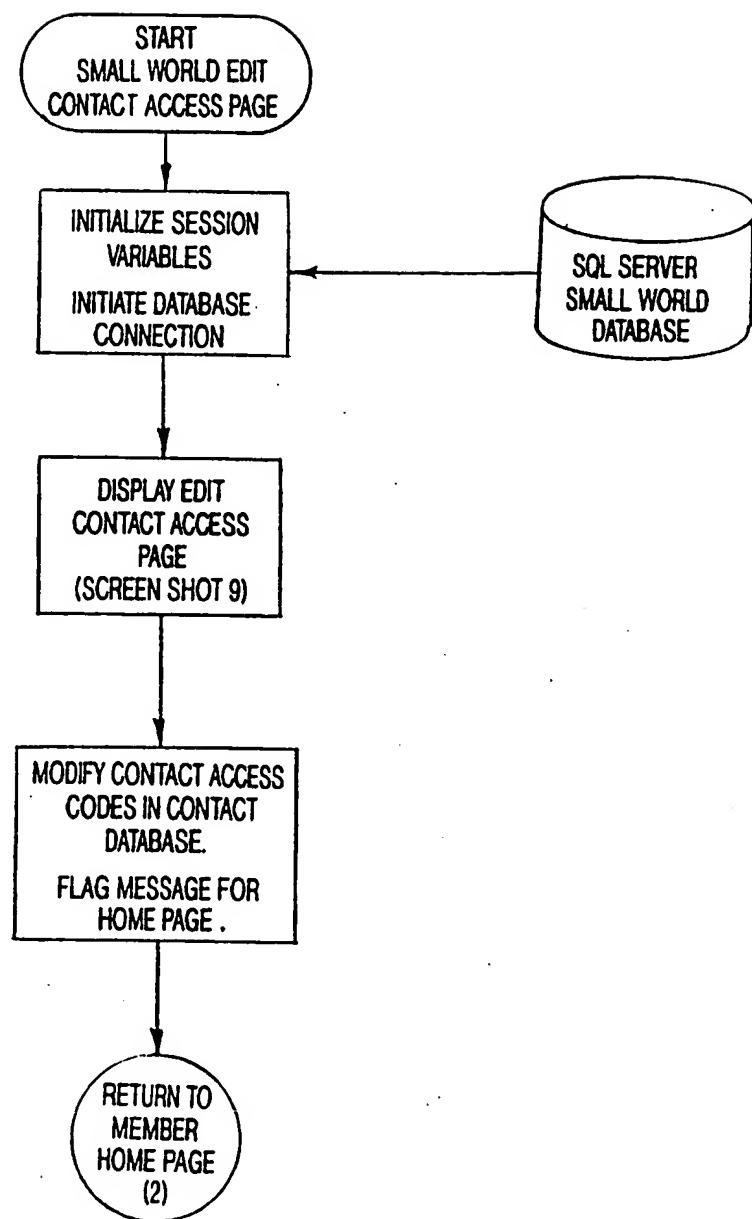


FIG-7

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8/24

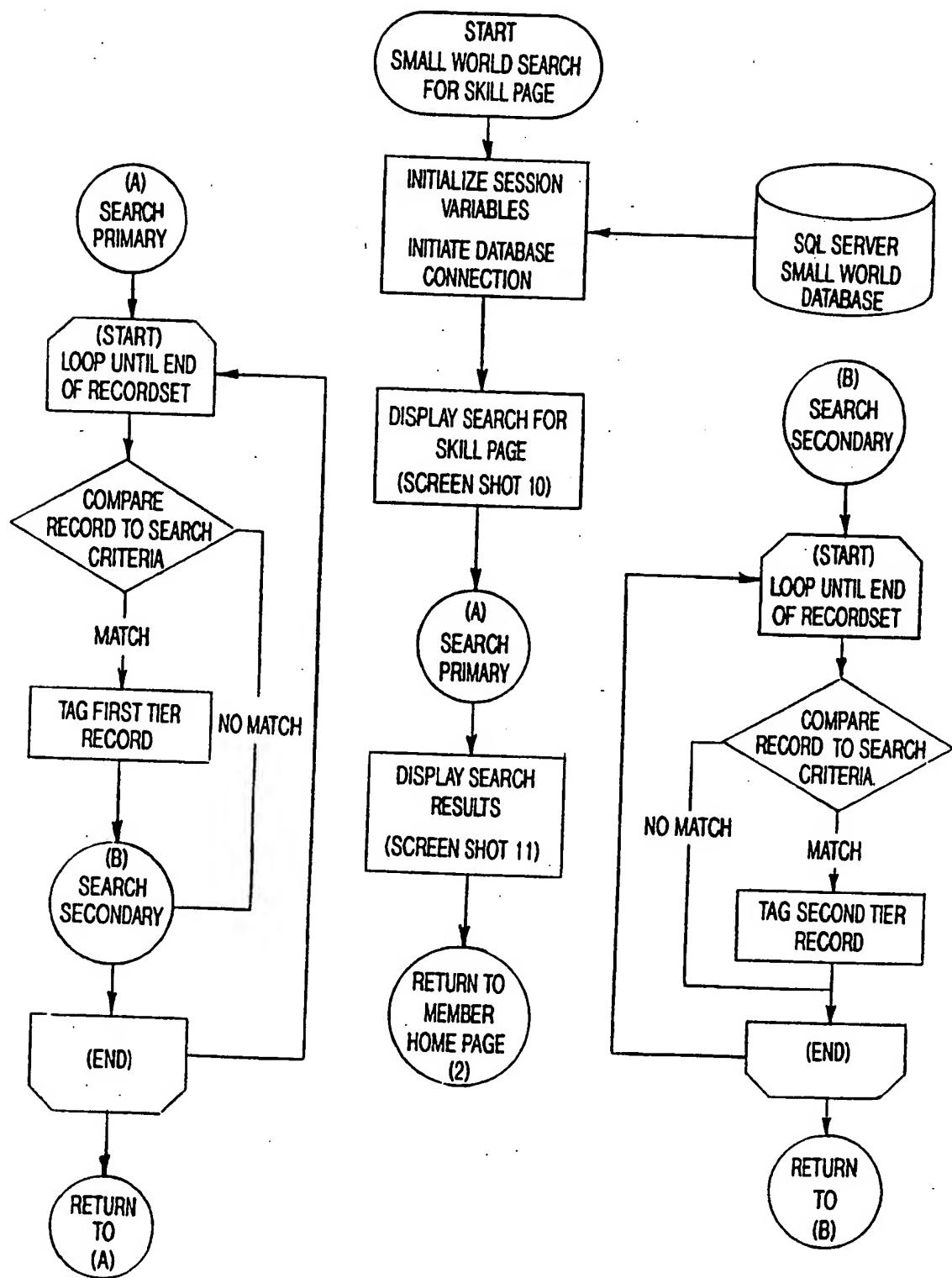


FIG-8  
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9/24

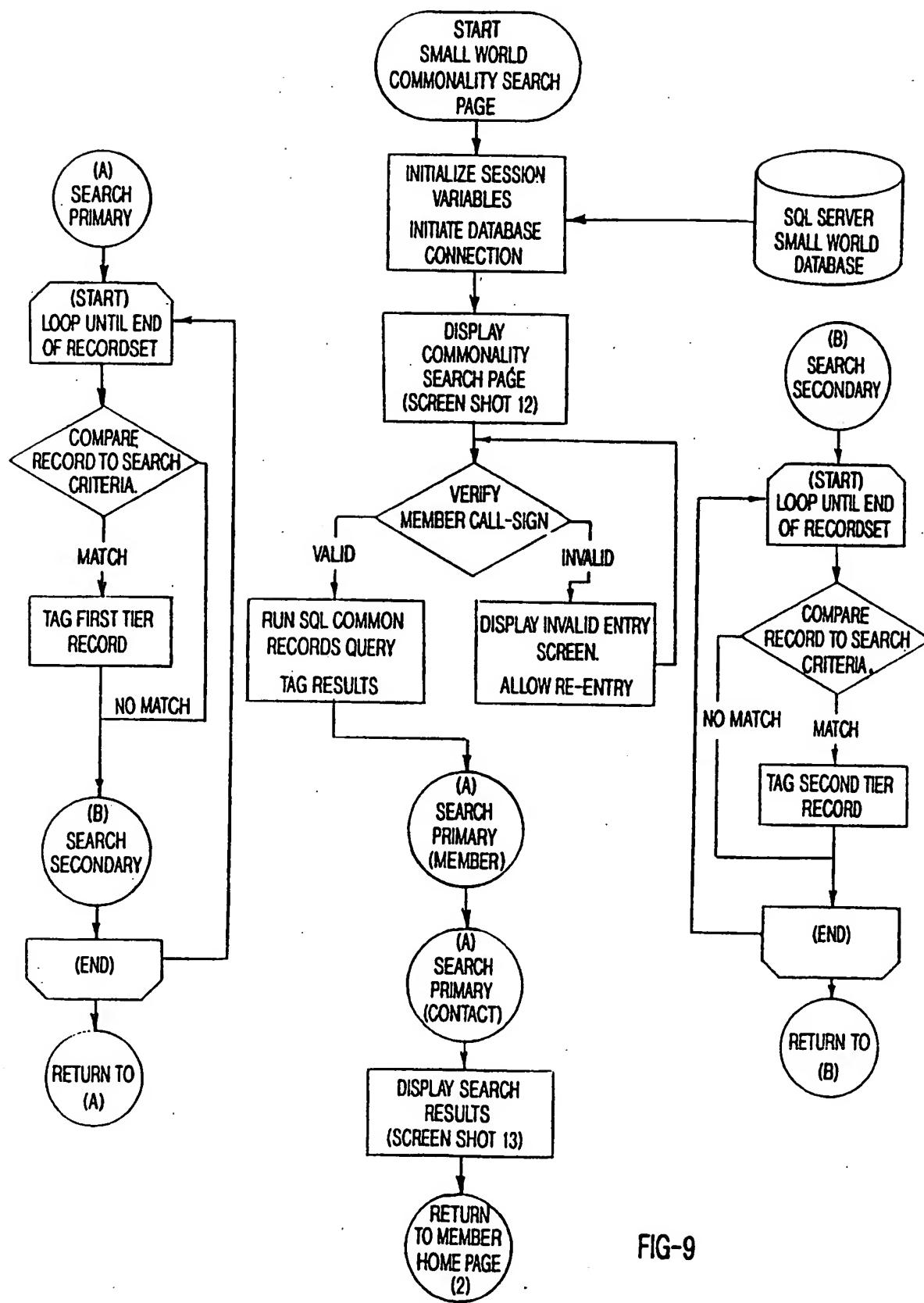


FIG-9

10/24

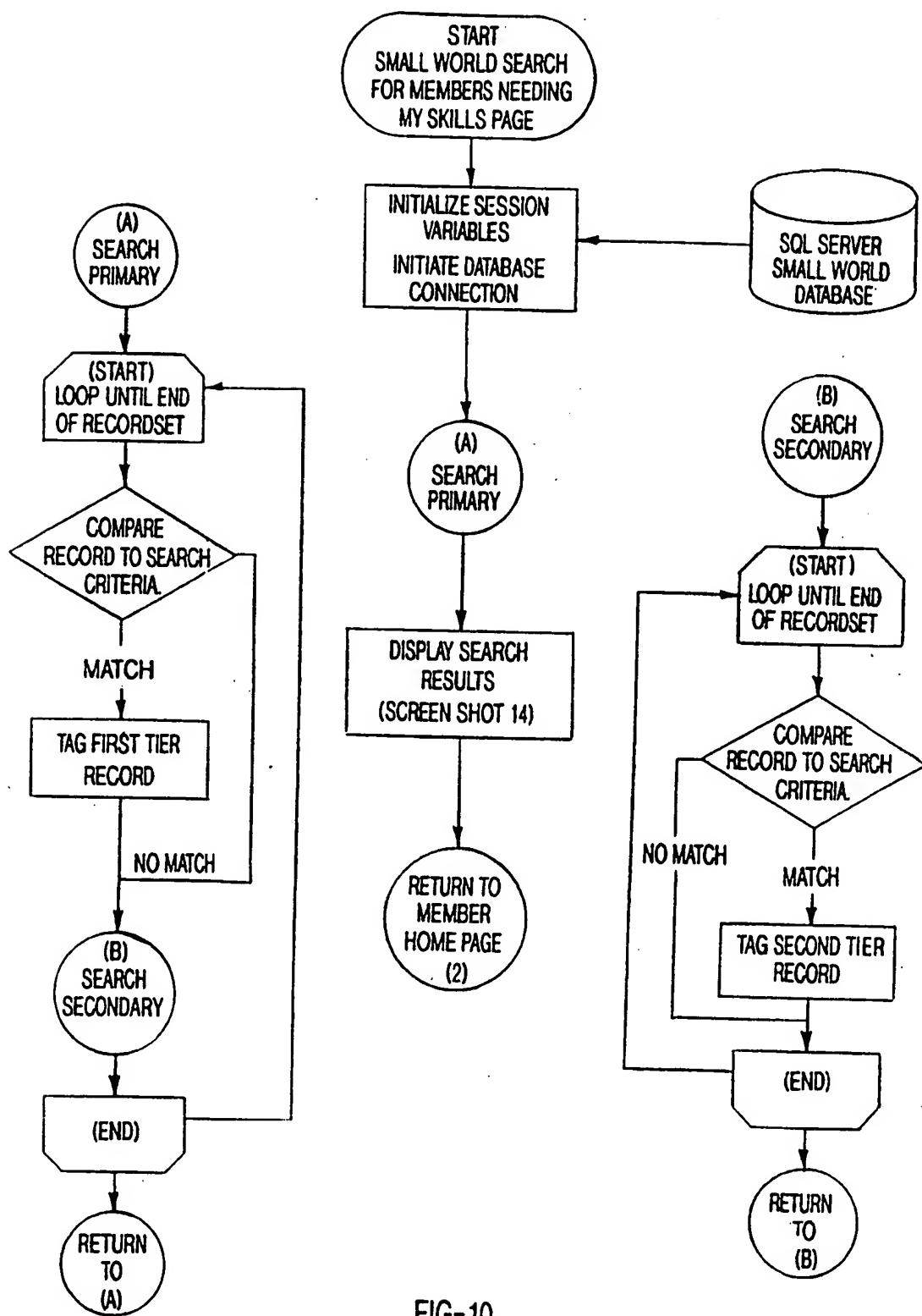


FIG-10

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11/24

Small World Member Login - Microsoft Internet Explorer

File Edit View Go Favorites Help  
Back Forward Stop Refresh Home Search Favorites Print Mail Font: Edit

Address | http://ibibpage1book.com/SmallWorld/login.asp

**Small World Member Authentication**

Remember, if you are already a Small World Member, just type in your Call-Sign and Password and click OK.

Member Call-Sign:   
Password:

If you have not yet registered for Small World Membership, you first need to fill out the form to get your Member ID Number and Password. Then you can access any of the Small World services. Click here to go to the Membership application, or hit the Cancel button to return to the homepage:

**Screen Shot 1**

FIG-11

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12/24

**Small World Member Login - Microsoft Internet Explorer**

**File Edit View Go Favorites Help**

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Address <http://litpage.libbook.com/SmallWorld/login.asp>

**Small World Member Authentication**

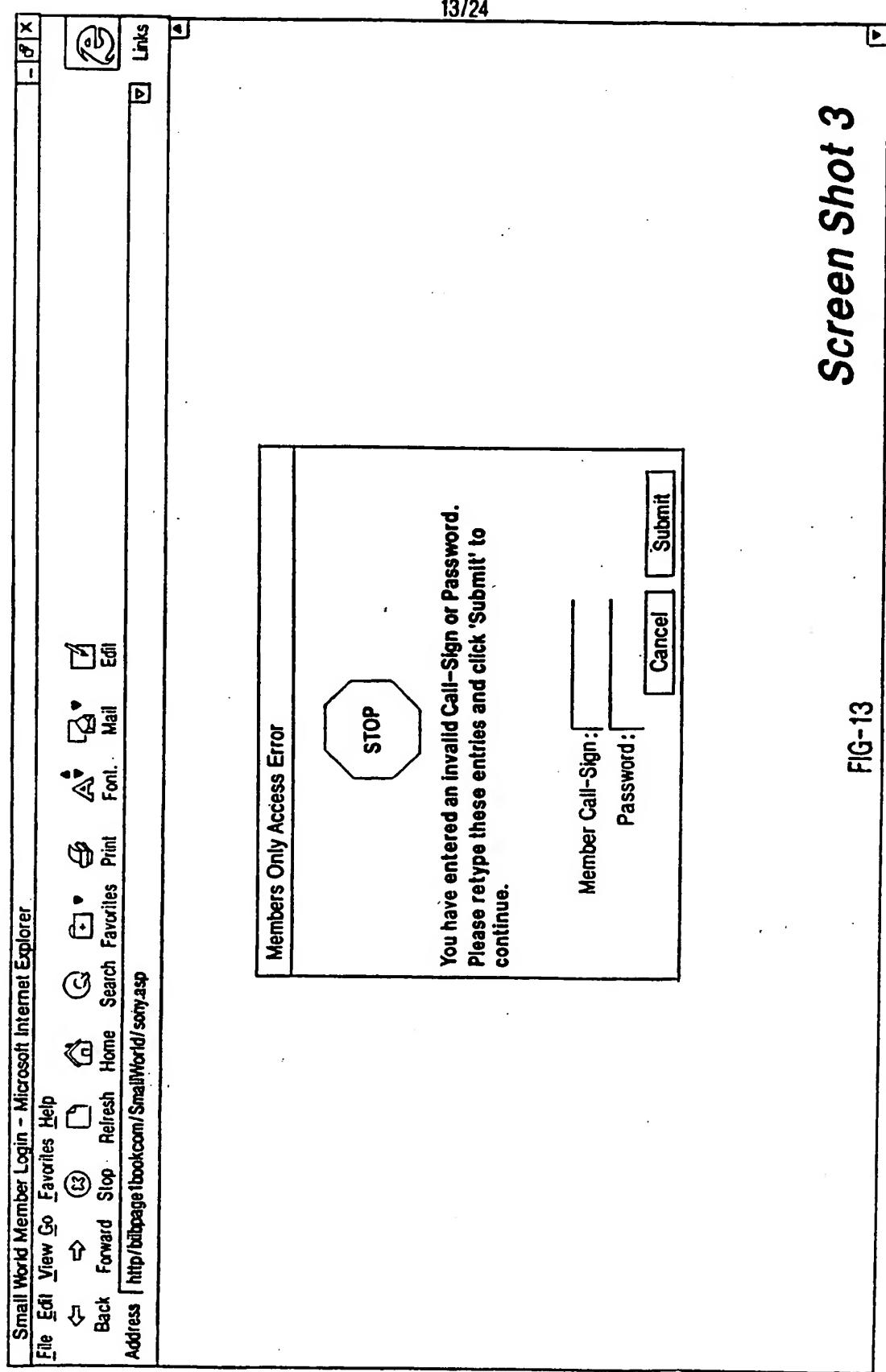
Welcome back, Kevin. Please type your password and click OK to continue.

Member Call-Sign:

Password:

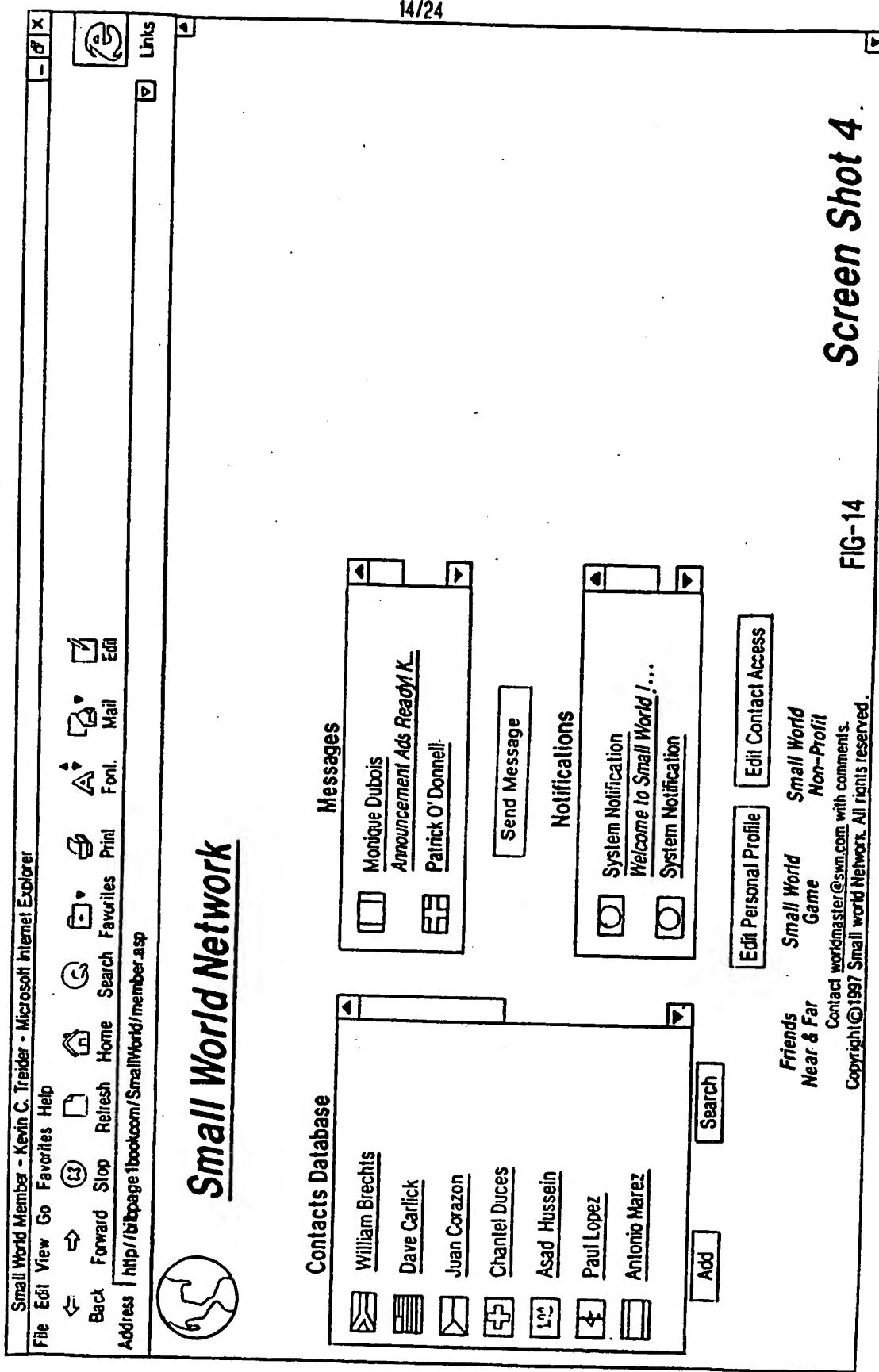
If you have not yet registered for Small World Membership, you first need to fill out the form to get your Member ID Number and Password. Then you can access any of the Small World services. Click here to go to the Membership application, or hit the Cancel button to return to the homepage.

**Screen Shot 2****FIG-12**



Screen Shot 3

FIG-13

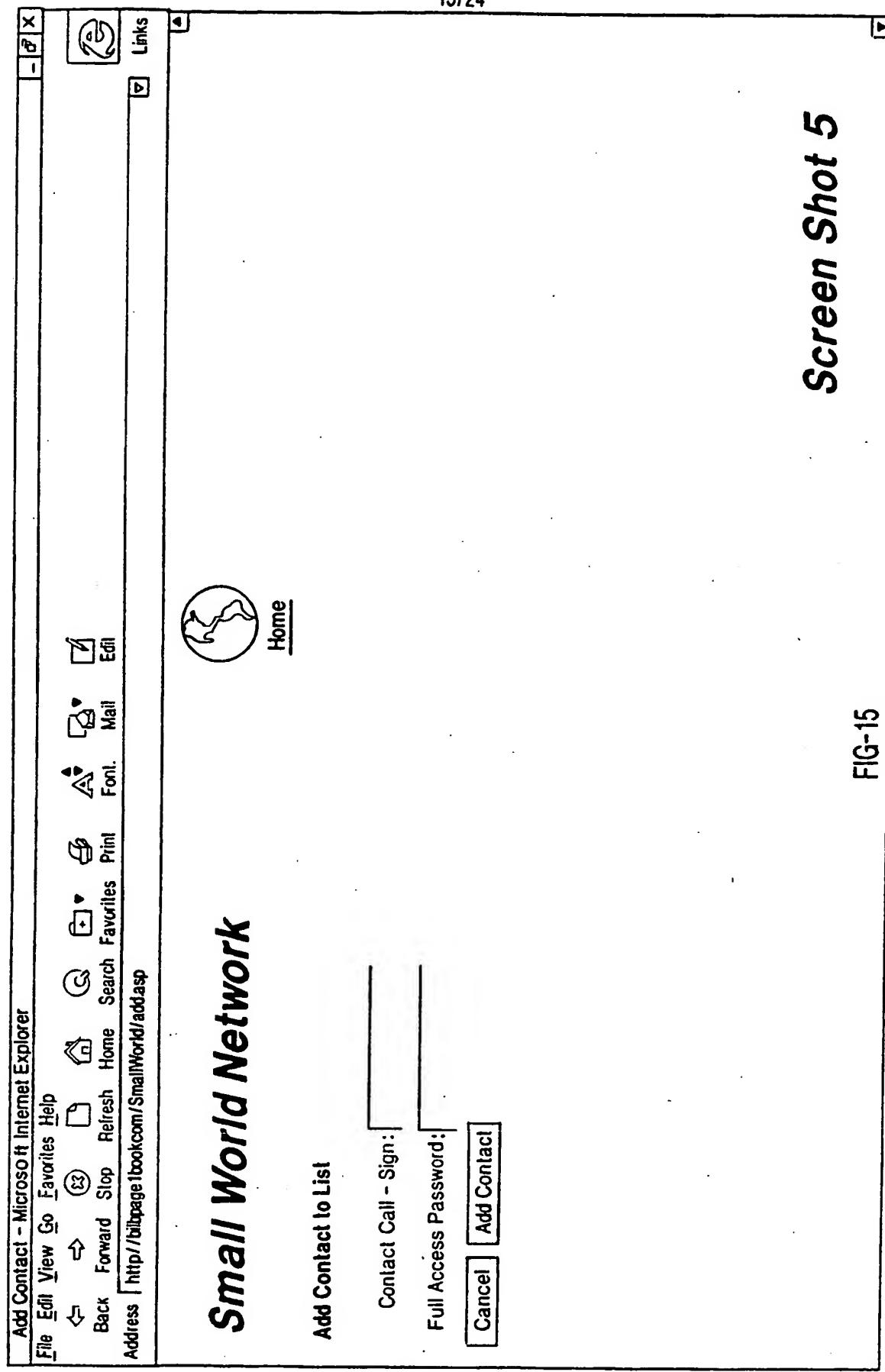


Screen Shot 4

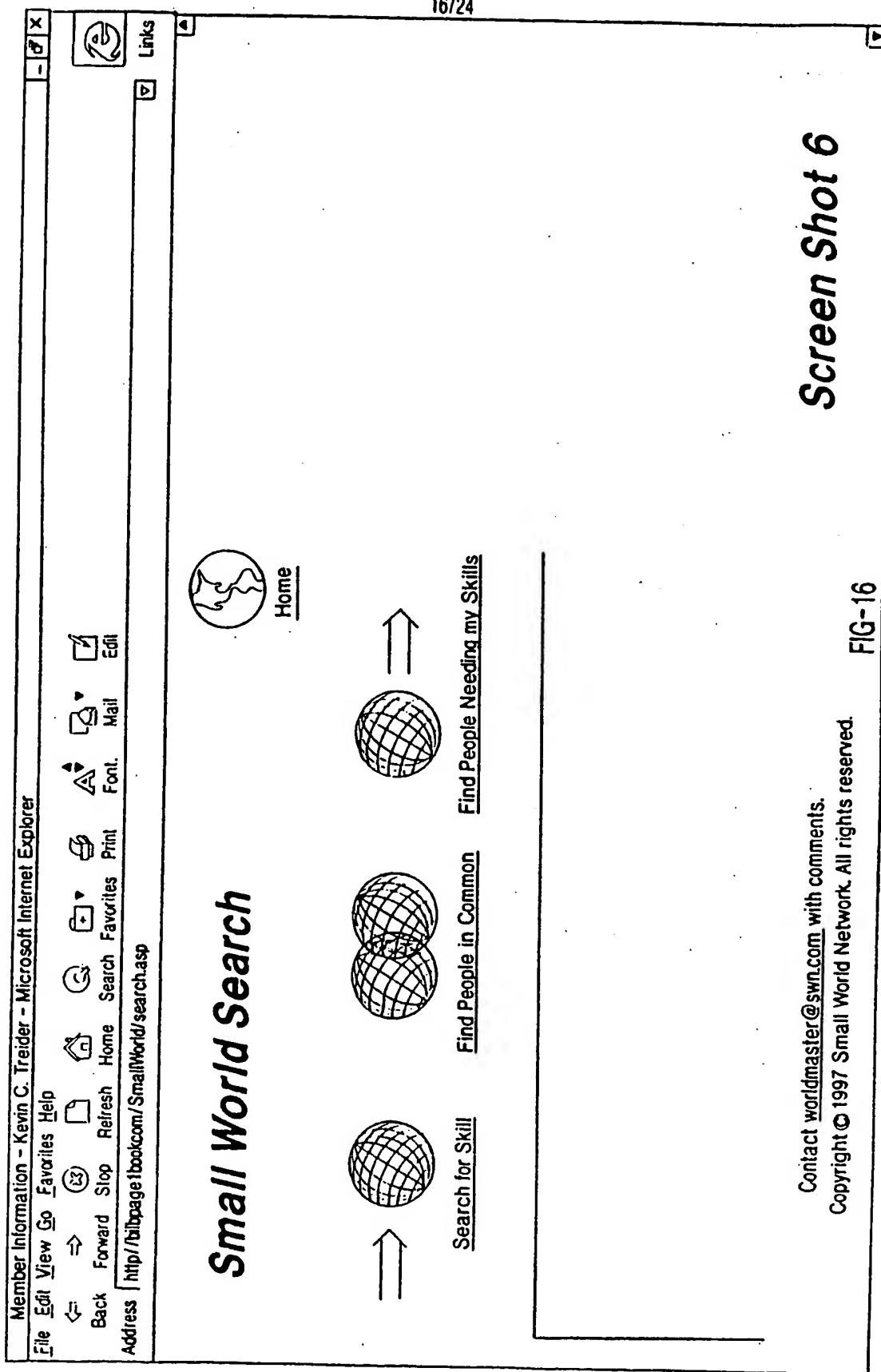
FIG-14

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15/24



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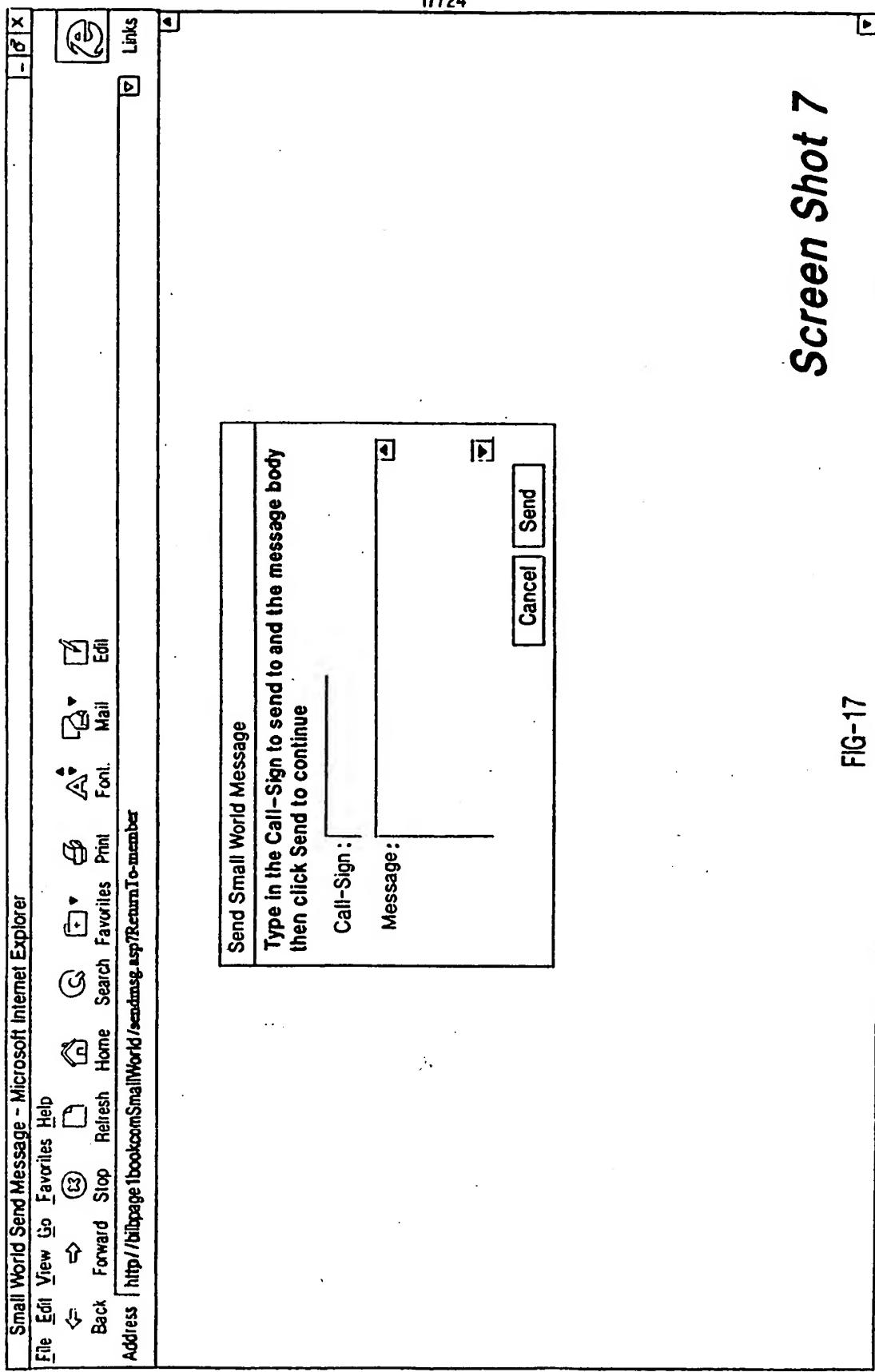


## Screen Shot 6

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FIG-16

17/24



**Screen Shot 7**

**FIG-17**

18/24

Member Information Kevin C. Treider - Microsoft Internet Explorer	
<a href="#">File</a>	<a href="#">Edit</a>
<a href="#">View</a>	<a href="#">Go</a>
<a href="#">Favorites</a>	<a href="#">Help</a>
Address: <a href="http://libpage.libook.com/SmallWorld/info/page.asp?contactID=A021">http://libpage.libook.com/SmallWorld/info/page.asp?contactID=A021</a>	
<b>Kevin C. Treider</b>	
<a href="#">Home</a>	
<a href="#">Title:</a> CPA <a href="#">Industry:</a> Engineering, Accounting, Research, Management, And Related Services ▶	
<a href="#">Call-Sign:</a> Treider 1 <a href="#">Company URL:</a> <a href="http://www.swn.com">www.swn.com</a> <a href="#">E-Mail:</a> <a href="mailto:kct@smn.com">kct@smn.com</a>	
<a href="#">Phone:</a> 1-505-265-8406 <a href="#">Fax:</a> 1-505-265-1290	
<a href="#">Address:</a> 1100 Rhode Island <a href="#">City:</a> Albuquerque <a href="#">State/Province:</a> NM <a href="#">Country:</a> United States	
<a href="#">Searching For :</a> Capital	
<a href="#">Additional Info:</a> Accounting Estate Management Tax Technology Investment Entrepreneur	

**Screen Shot 8**

FIG-18

19/24

- ⌂ X

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Address: <http://billpage1book.com/SmallWorld/results.asp?Type=Contact>

**Search Results**

Home



*Edit Contact Permissions*

**Member Name Access Rights**

Dave S. Carlick  Full Access  Partial Access  No Access

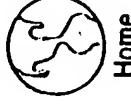
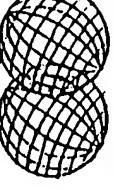
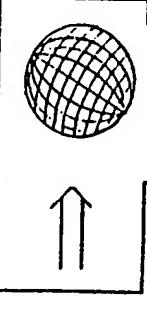
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**Screen Shot 9**

FIG-19

20/24

<p><b>File Edit View Go Favorites Help</b></p> <p>Back Forward Stop Refresh Home Search Favorites Print Mail Mail Edit</p> <p>Address <a href="http://billpage1bookcom/SmallWorld/search.asp">http://billpage1bookcom/SmallWorld/search.asp</a>.</p>	 <p><b>Small World Search</b></p> <p><a href="#">Home</a>  </p> <p><a href="#">Search for Skill</a>  <a href="#">Find People in Common</a> <a href="#">Find People Needing my Skills</a></p>	<p><b>Search For Skill:</b></p> <p>Skill: <input type="text"/></p> <p><input type="button" value="Search"/></p>	<p>Contact <a href="mailto:worldmaster@swm.com">worldmaster@swm.com</a> with comments. copyright © 1997 Small World Network. All rights reserved</p> <p>Shortcut to results.asp?Type-My Skills</p> <p><b>Screen Shot 10</b></p> <p>FIG-20</p>
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21/24

**Search Results**

Skill Search - Keyword: *Invest*

*Kevin C. Treider*

  └ Dave S. Carlick

    └ wolfgang

      └ Portfolio Management Finance Investments Mutual Funds

        └ Treider 1

          └ Accounting Estate Management Tax Technology

          └ Investment Entrepreneur

    └ Rob S. Thomas

      └ Investment Banking Finance Mutual Funds Pensions Management

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**Screen Shot 11**

FIG-21

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22/24

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## Small World Search

Links

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Find People Needing my Skills

Search for Skill

Member Call-Sign:

Search

Contact worldmaster@swn.com with comments.  
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**Screen Shot 12**

FIG-22

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23/24

**Search Results**

**People In Common:**

- Paul M. Lopez, Pilot-SWA
- Chuck F. Martin, VP - IBM
- Barbara E. Schluter, Financial Analyst - MS
- Joseph K. Shaw, Project Manager - MCI

**Potential Matches -**

Kevin C. Treider	Dave S. Carlick
Kevin C. Treider, CPA - SWN	Dave S. Carlick, Executive VP - PTSV
Kevin C. Treider, CPA - SWN	Patrick J. O'Donnell, VP International Sales - AEX
Yusuke N. Tsuji, Public Relations Manager - SNY	Dave S. Carlick, Executive VP - PTSV
Yusuke N. Tsuji, Public Relations Manager - SNY	Wolfgang H. Kohl, Portfolio Manager - CBK

**Address** http://billpage/bookcom/SmallWorld/results.aspx?Type=Common

**Links**

**23/24**

**Screen Shot 13**

FIG-23

24/24

Search Results - Microsoft Internet Explorer

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Search Results

Skill Search - People Needing My Skills

*Kevin C. Treider*  
Accounting Estate Management Tax Technology Investment Entrepreneur

Dave S. Carlick  
Is searching for: Technology

pat71  
Is searching for: Accounting

Yusuke N. Tsuji  
Is searching for: Investment

Contact [worldmaster@swn.com](mailto:worldmaster@swn.com) with comments.  
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Screen Shot 14

FIG-24

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US97/21853

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :G06F 13/00  
US CL :395/186, 726, 892; 705/1; 711/163  
According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 395/186, 726, 892; 705/1; 711/163

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 5,086,394 (SHAPIRA) 04 February 1992, Abstract, claim 1, col. 7, lines 44-51, col. 9, lines 4-19, col. 10, lines 38-40.	1-10
Y	US, A, 5,263,165 (JANIS) 16 November 1993, Abstract, col. 2, lines 62-68, col. 3, lines 1-2.	1-10

Further documents are listed in the continuation of Box C.  See patent family annex.

- \* Special categories of cited documents:
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Date of the actual completion of the international search

12 FEBRUARY 1998

Date of mailing of the international search report

13 APR 1998

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